

FIG. 1

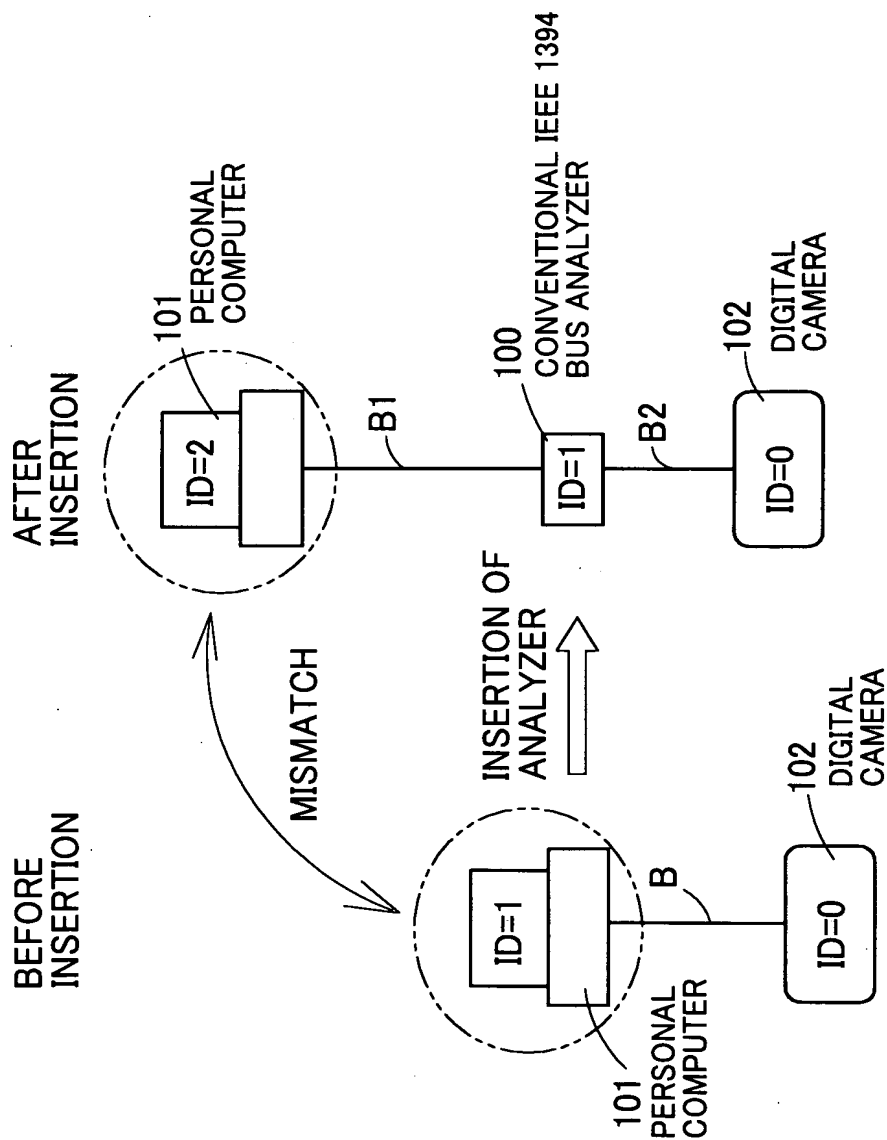


FIG. 2

CONSTRUCTION IN WHICH CONVENTIONAL BUS ANALYZER IS CONNECTED TO IEEE 1394 BUS TO WHICH A NUMBER OF DEVICES ARE CONNECTED

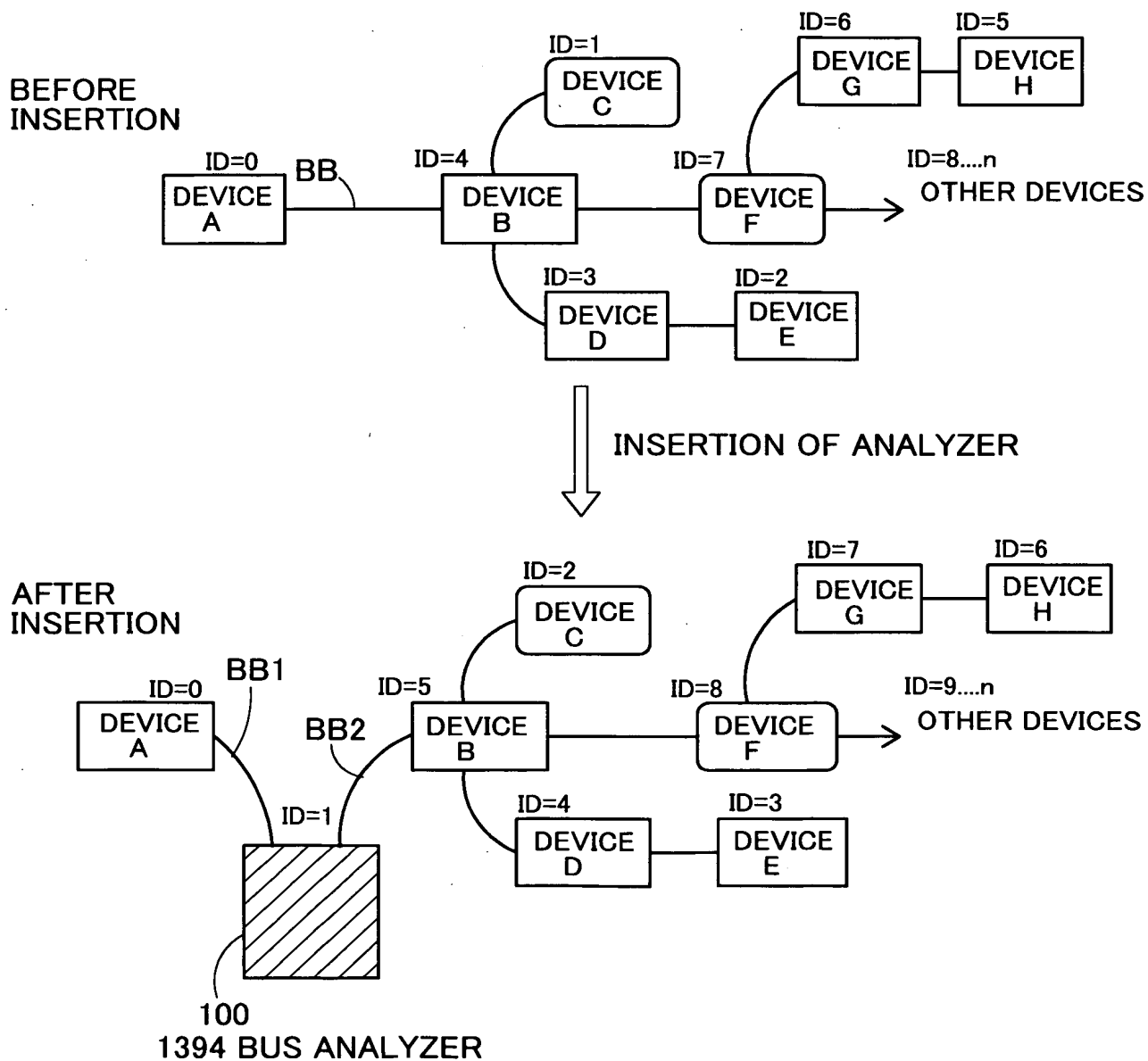


FIG. 3 CONSTRUCTION IN WHICH BUS ANALYZER OF FIRST EMBODIMENT IS CONNECTED TO IEEE 1394 BUS

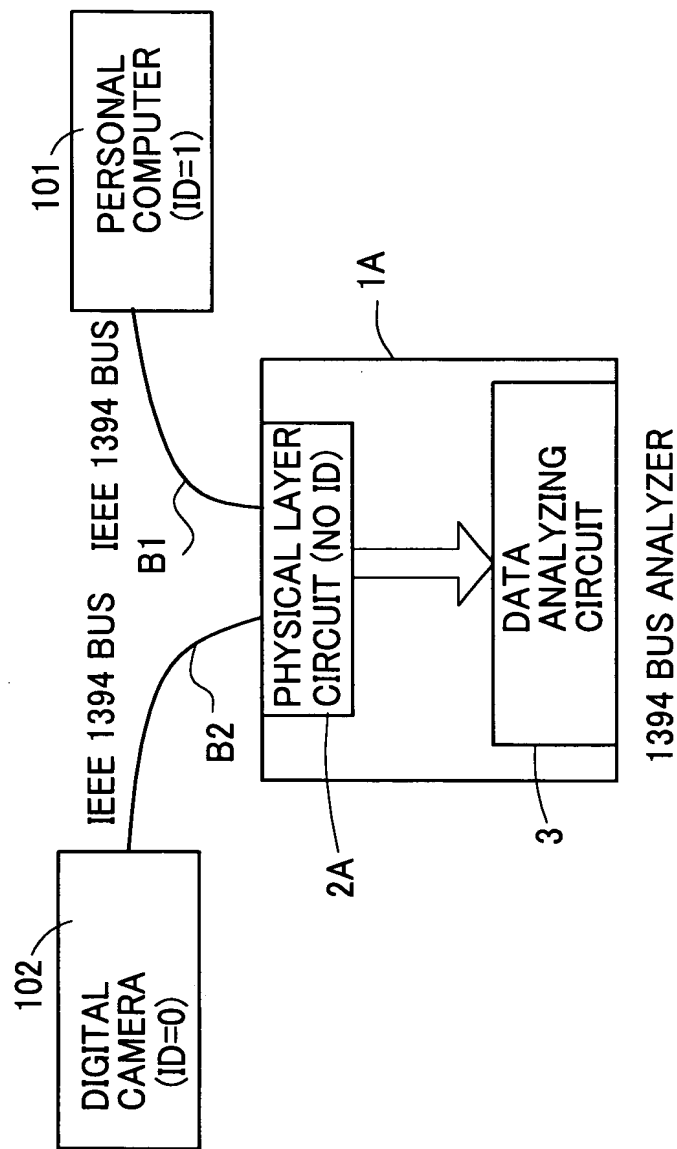


FIG. 4

STATE TRANSITION DIAGRAM SHOWING TREE—IDENTIFYING OPERATION
IN FIRST EMBODIMENT

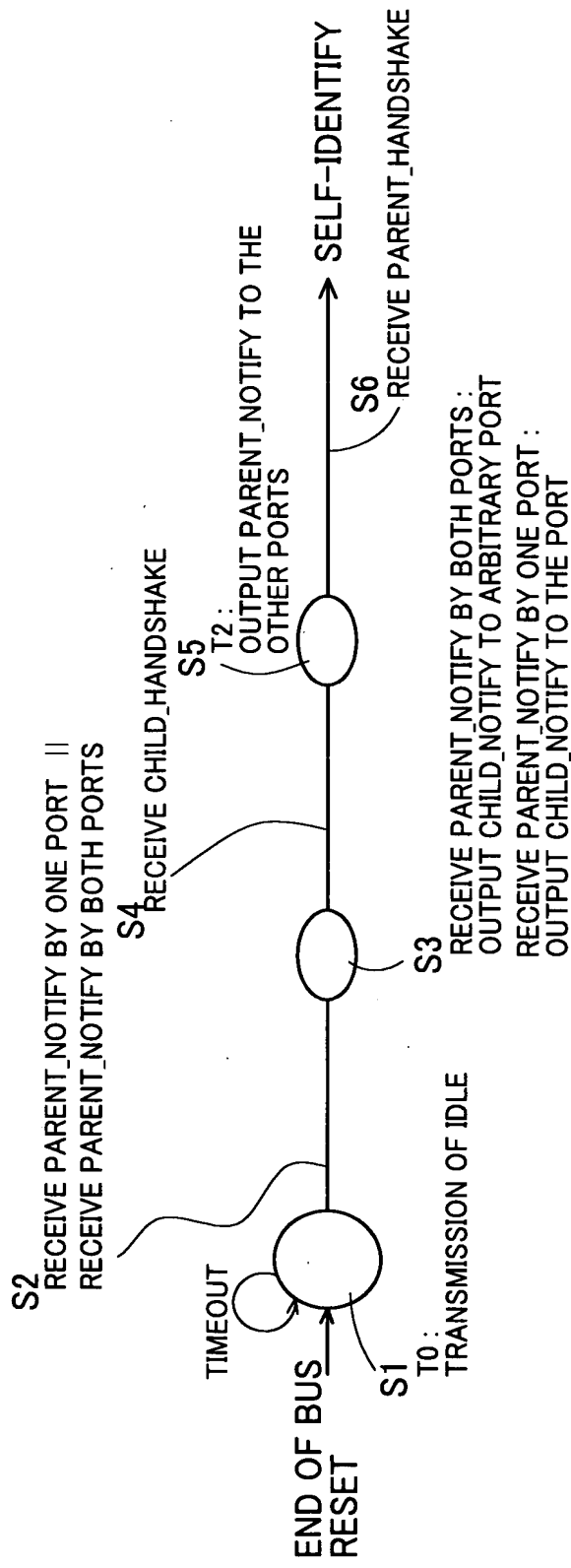


FIG. 5

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING OPERATION IN FIRST EMBODIMENT

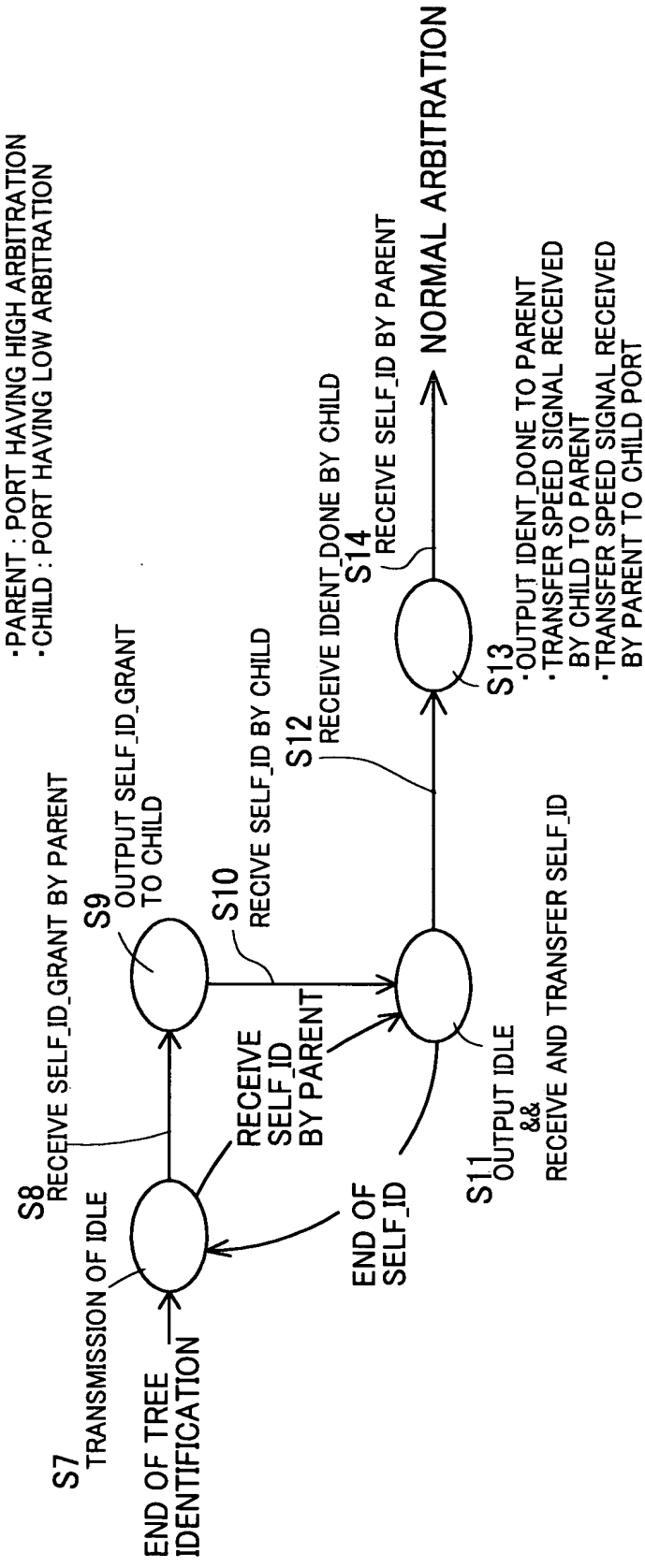
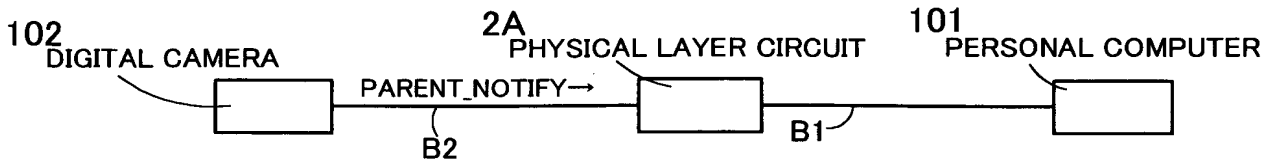
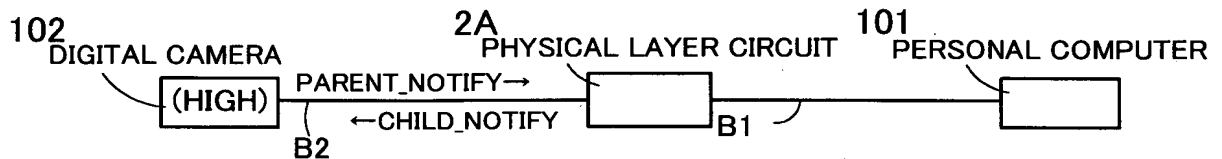


FIG. 6 TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT
(RECEIVE PARENT_NOTIFY BY ONE OF PORTS)

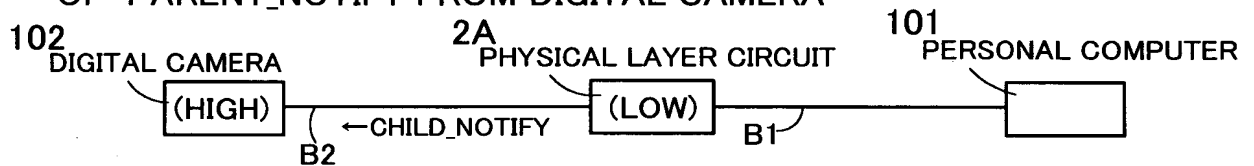
(P1) RECEIVE PARENT_NOTIFY FROM DIGITAL CAMERA



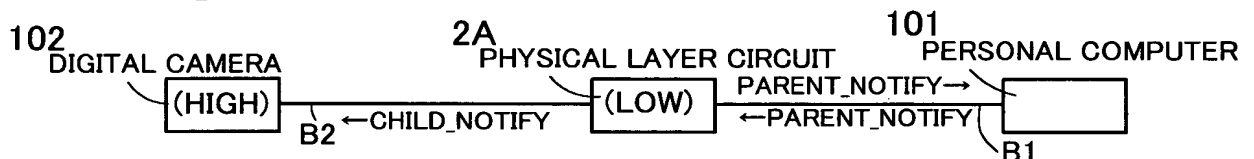
(P2) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA



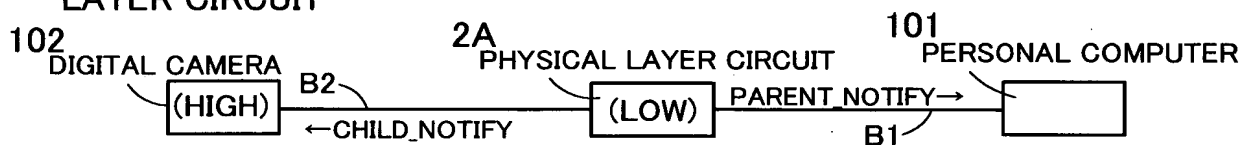
(P3) RECEIVE CHILD_HANDSHAKE BY STOPPING OUTPUT OF PARENT_NOTIFY FROM DIGITAL CAMERA



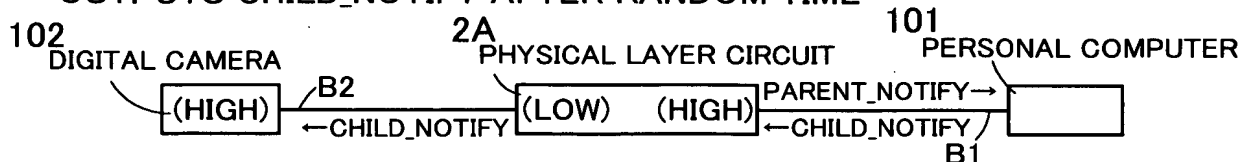
(P4) OUTPUT PARENT_NOTIFY TO THE OTHER PORT RECEIVE ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO OUTPUTS PARENT_NOTIFY AT THIS TIME



(P5) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL LAYER CIRCUIT



(P6) RECEIVE PARENT_HANDSHAKE WHEN PERSONAL COMPUTER OUTPUTS CHILD_NOTIFY AFTER RANDOM TIME



(P12) STOP OUTPUTTING SIGNALS FROM BOTH PORTS, THEREBY FINISHING TREE-IDENTIFYING OPERATION

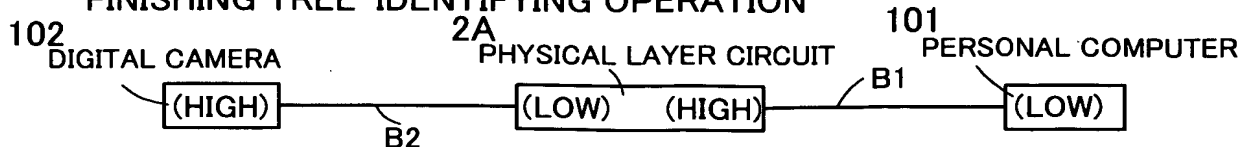
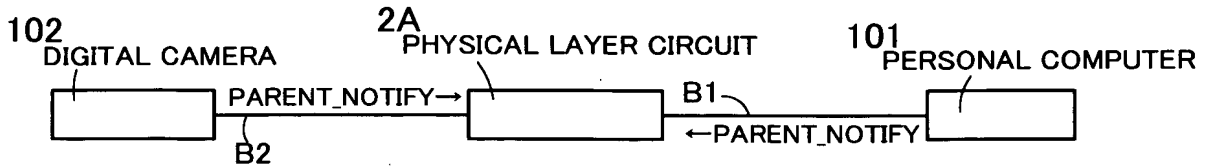


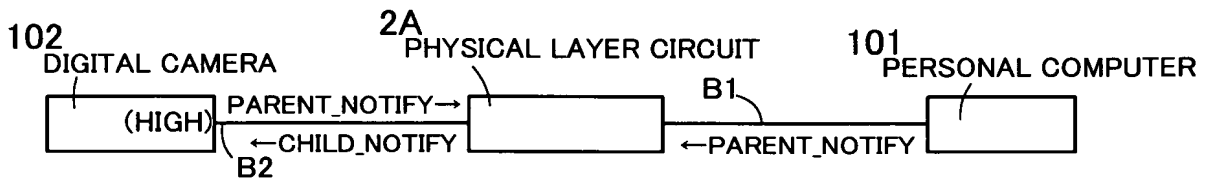
FIG. 7

TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT (RECEIVE PARENT_NOTIFY BY BOTH PORTS)

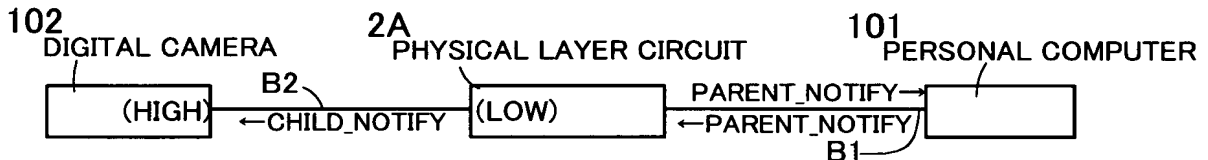
(P7) RECEIVE PARENT_NOTIFY FROM BOTH DEVICES



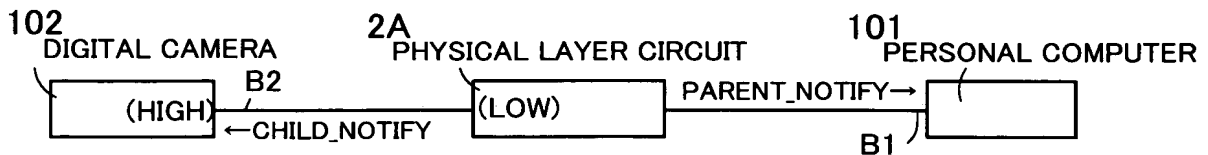
(P8) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA



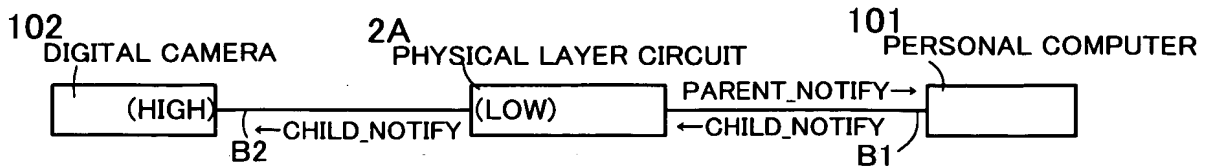
(P9) STOP OUTPUTTING PARENT_NOTIFY FROM DIGITAL CAMERA TO THEREBY RECEIVE CHILD_HANDSHAKE, AND OUTPUT PARENT_NOTIFY TO PERSONAL COMPUTER. RECEIVE ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO OUTPUTS PARENT_NOTIFY AT THIS TIME.



(P10) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL LAYER CIRCUIT



(P11) OUTPUT CHILD_NOTIFY FROM PERSONAL COMPUTER AFTER RANDOM TIME, THEREBY RECEIVING PARENT_HANDSHAKE



(P12) FINISH TREE-IDENTIFYING OPERATION

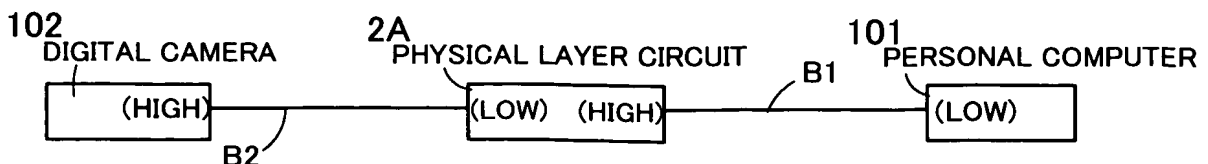
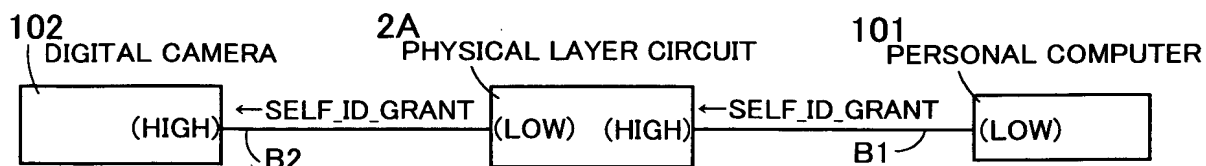


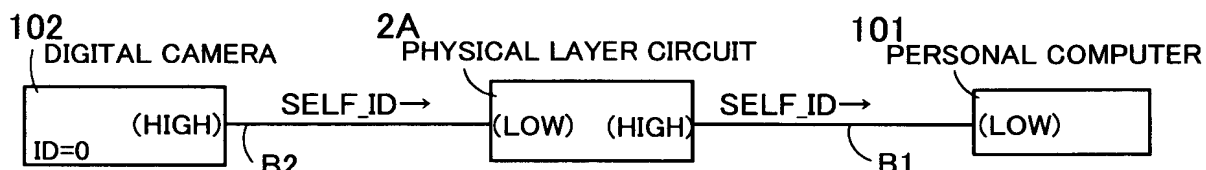
FIG. 8

SELF-IDENTIFYING OPERATION IN FIRST EMBODIMENT

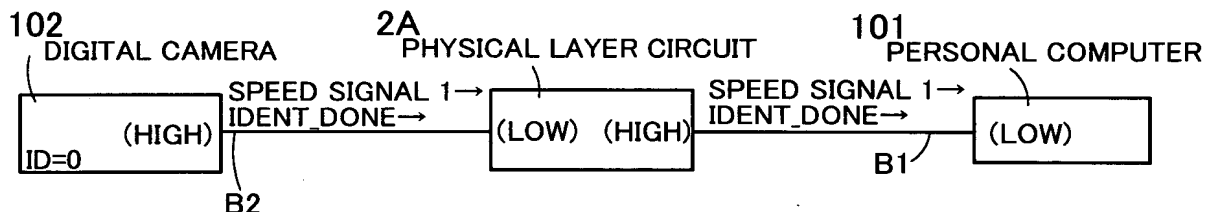
(P13) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER AND TRANSFER IT TO DIGITAL CAMERA



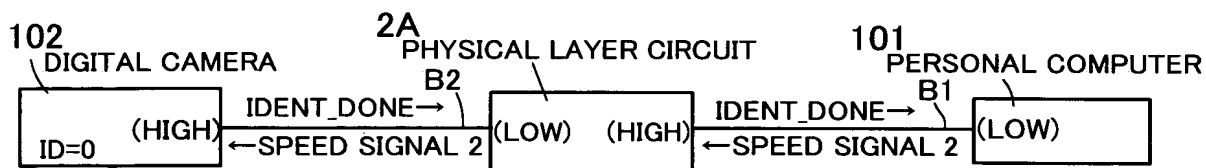
(P14) RECEIVE SELF_ID PACKET FROM DIGITAL CAMERA AND TRANSFER IT TO PERSONAL COMPUTER



(P15) RECEIVE IDENT_DONE PACKET AND SPEED SIGNAL FROM DIGITAL CAMERA AND TRANSFER THEM TO PERSONAL COMPUTER



(P16) RECEIVE SPEED SIGNAL FROM PERSONAL COMPUTER AND TRANSFER IT TO DIGITAL CAMERA



(P17) RECEIVE SELF_ID PACKET FROM PERSONAL COMPUTER AND FINISH SELF_IDENTIFYING OPERATION

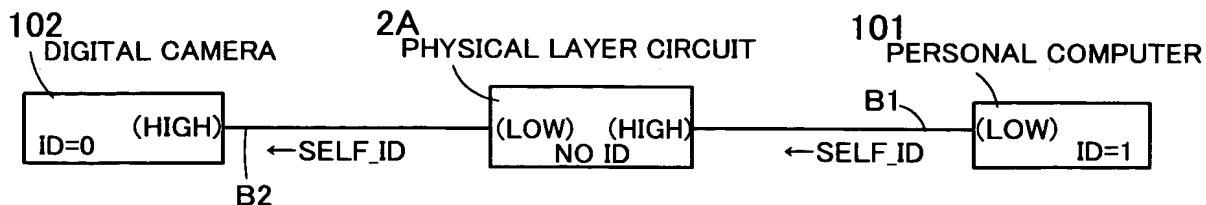
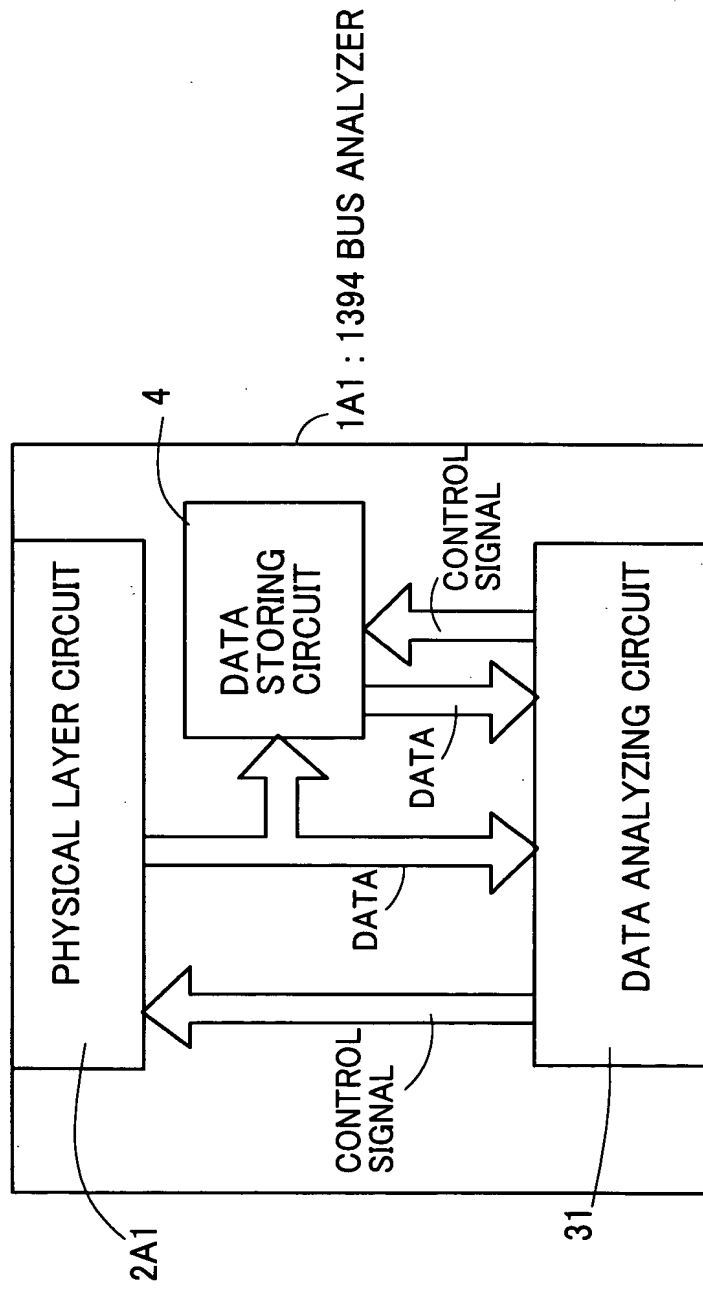


FIG. 9

FIRST MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT



SECOND MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

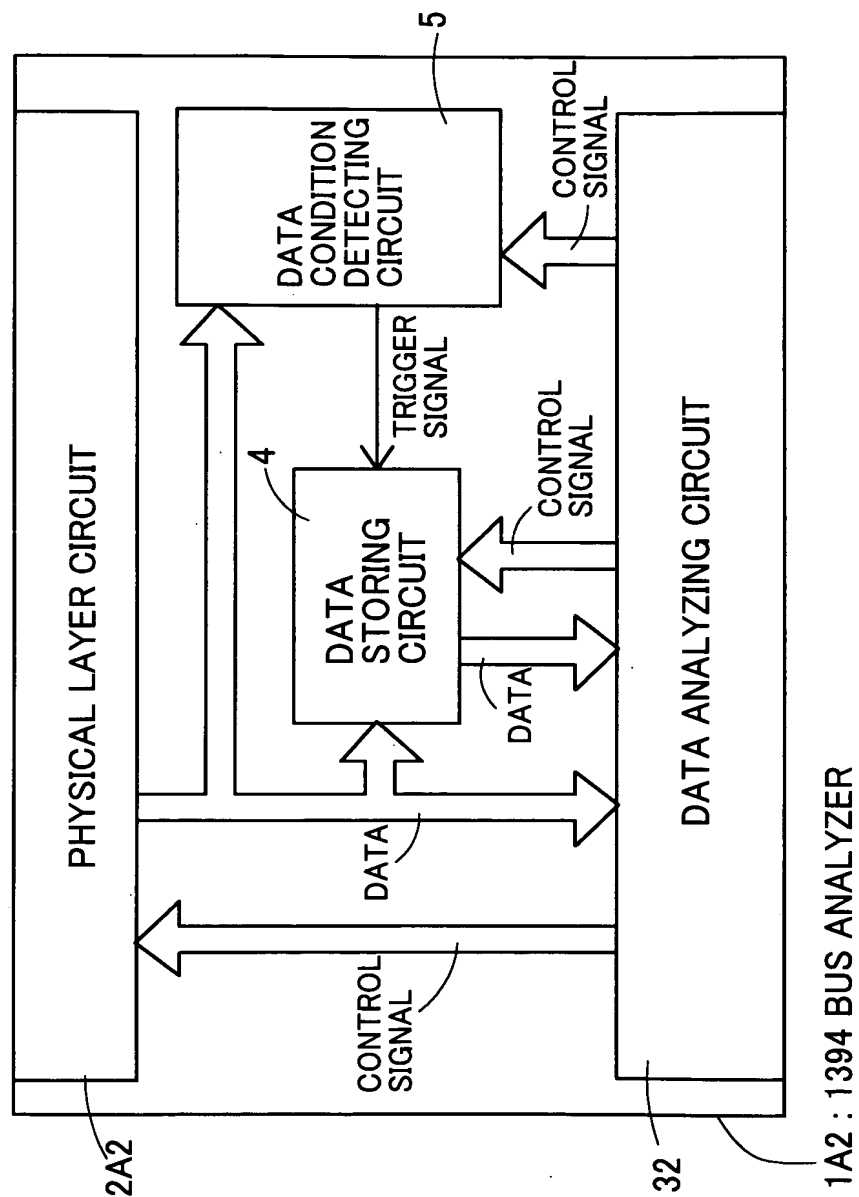


FIG. 11

THIRD MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

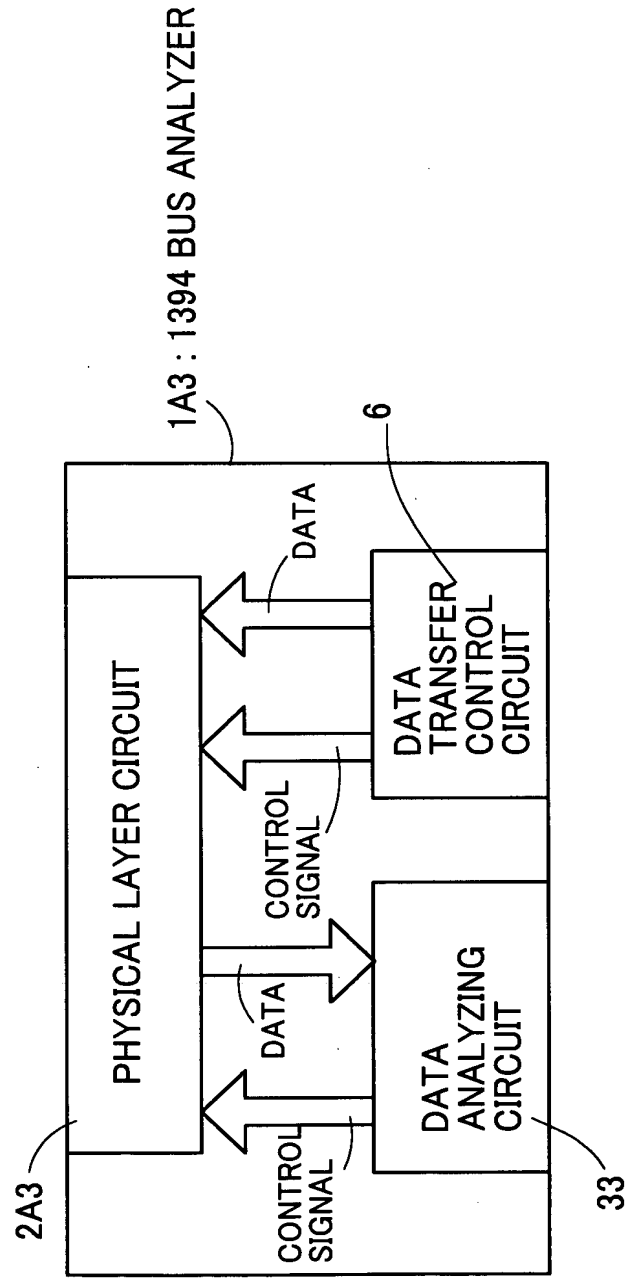


FIG. 12

FOURTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

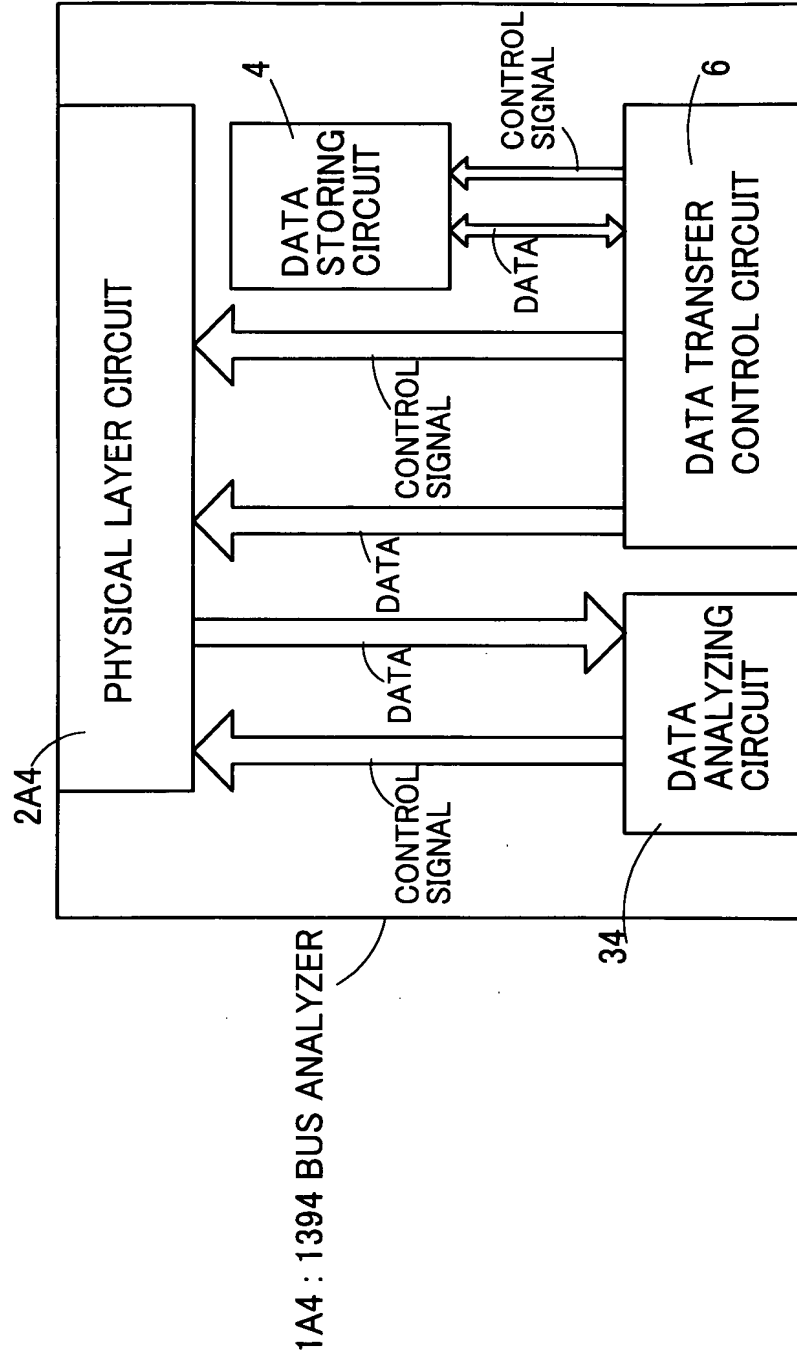


FIG. 13

FIFTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

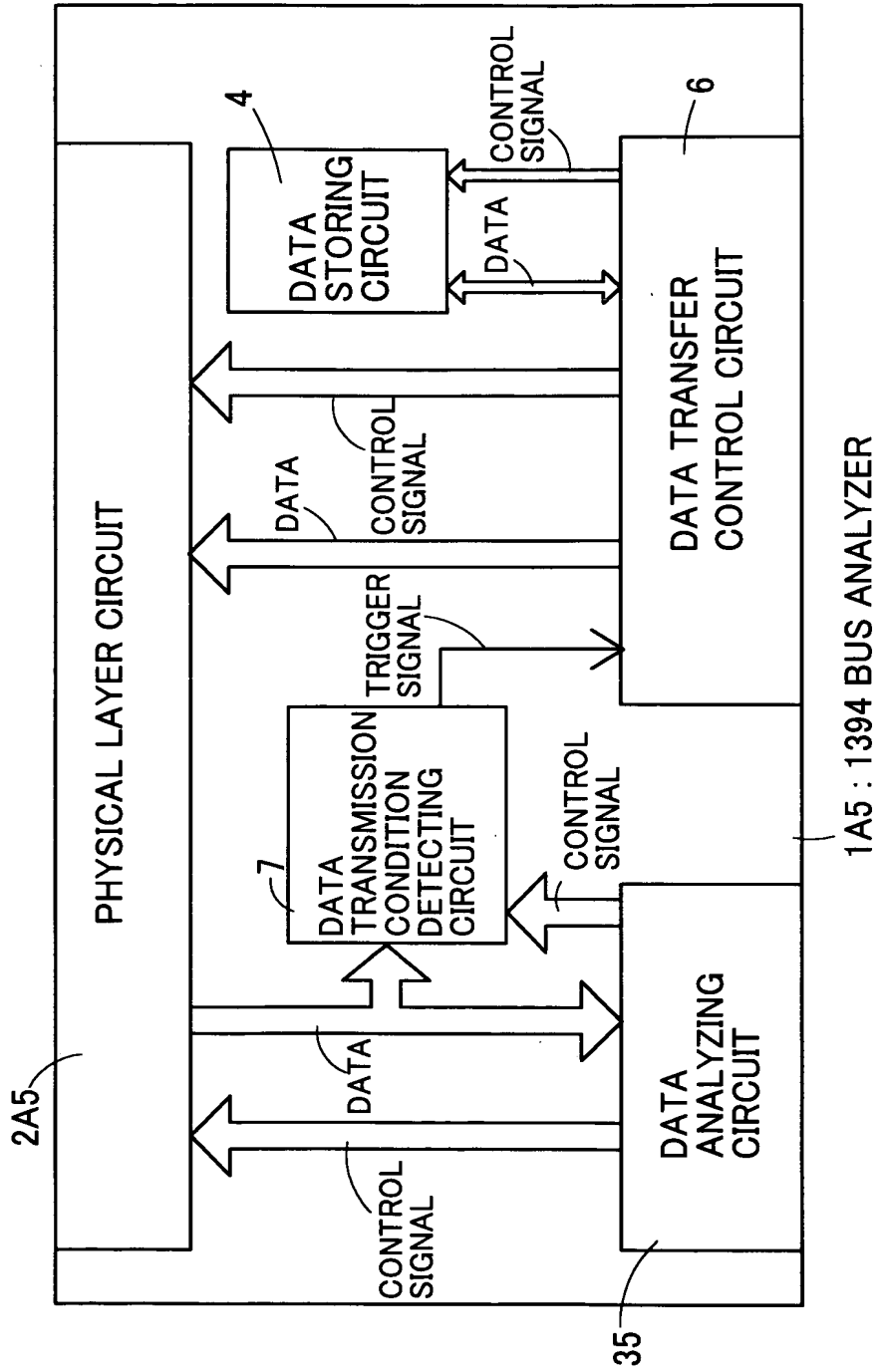


FIG. 14 SIXTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

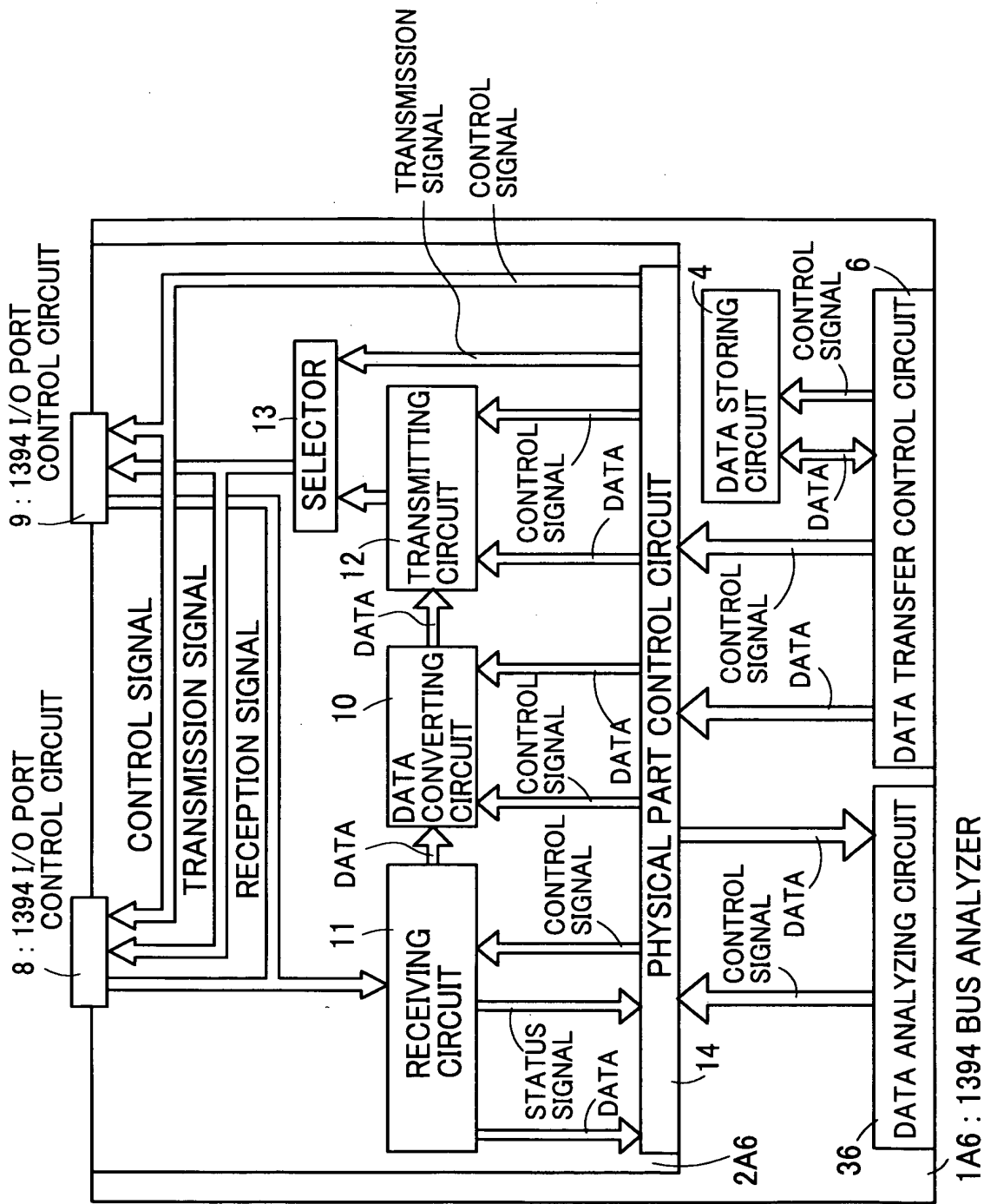


FIG. 15

FIRST CONSTRUCTION EXAMPLE OF IEEE 1394 BUS TO WHICH
BUS ANALYZER OF SECOND EMBODIMENT IS CONNECTED

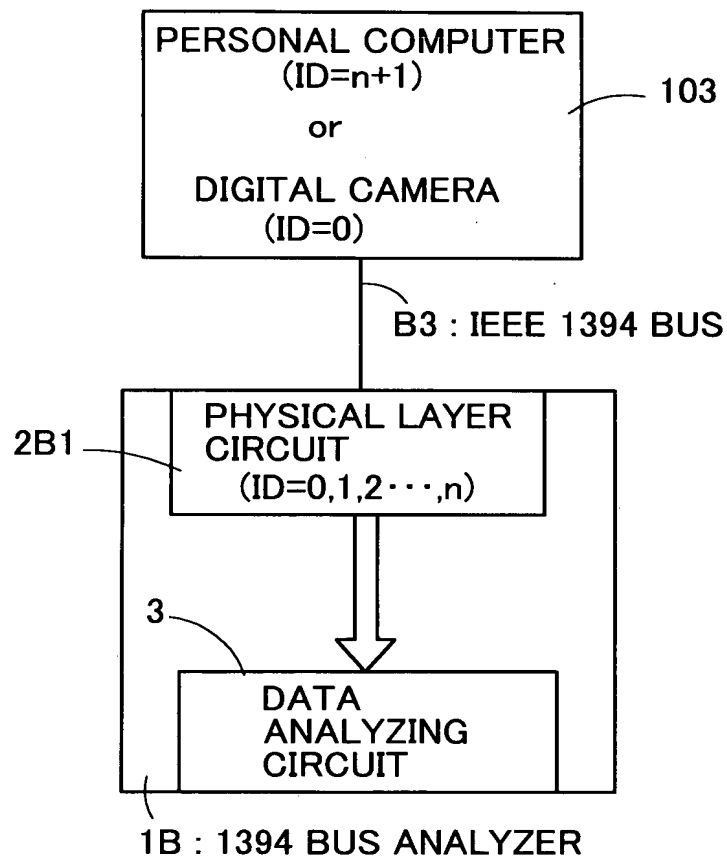


FIG. 16

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT

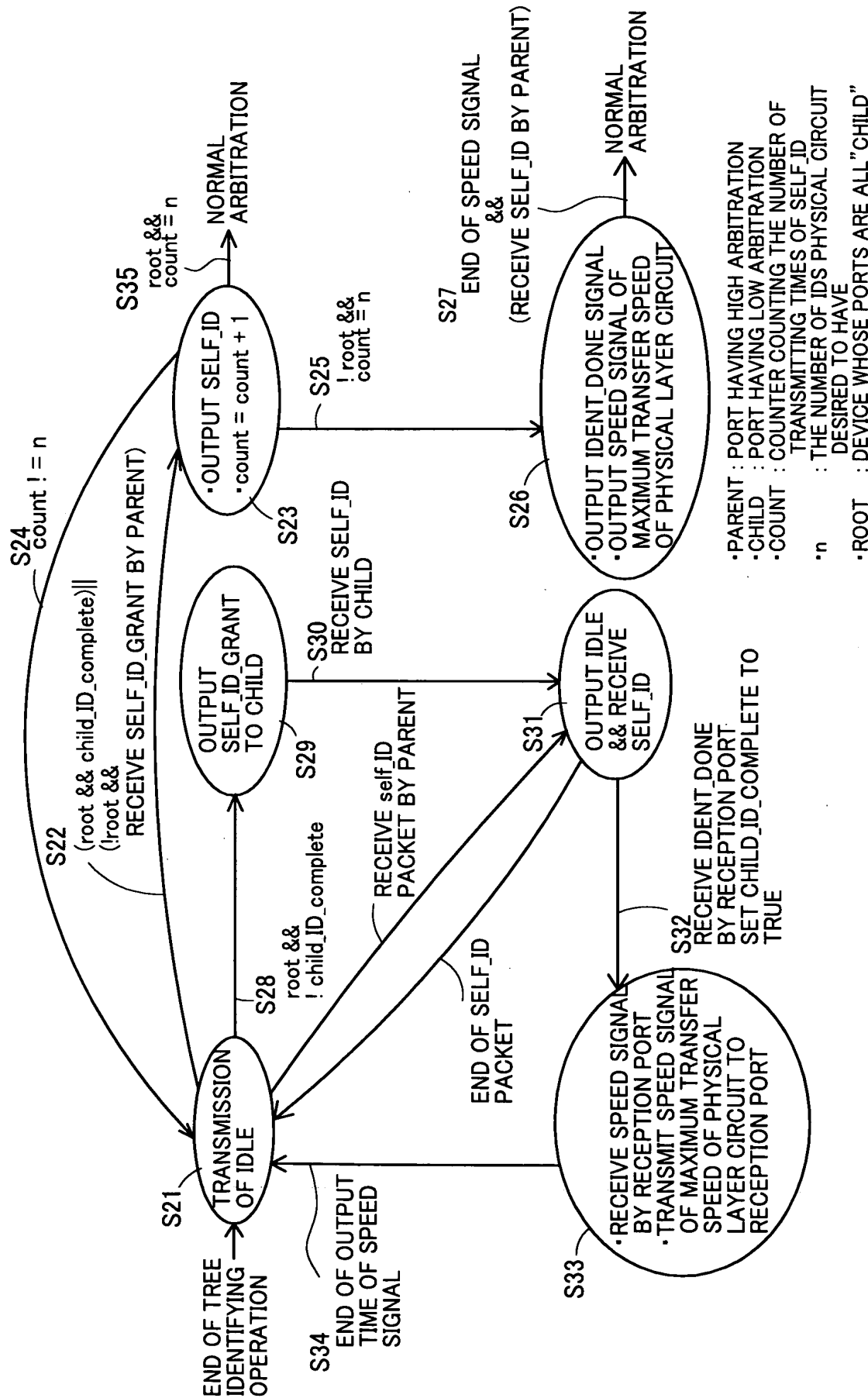
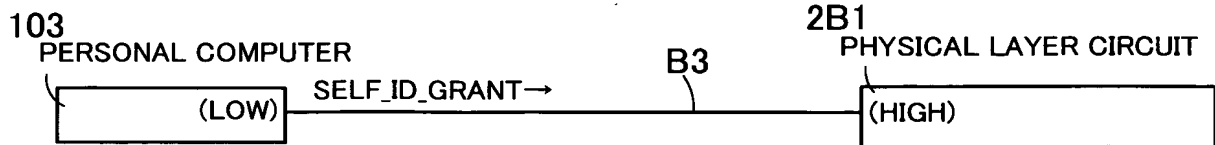


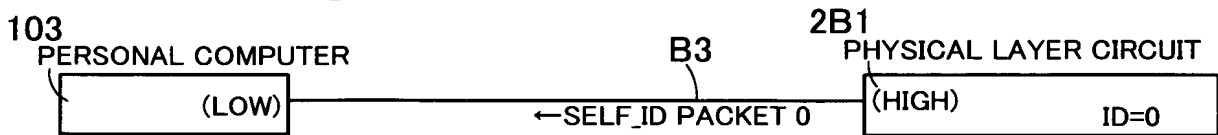
FIG. 17

SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS HIGH ARBITRATION)

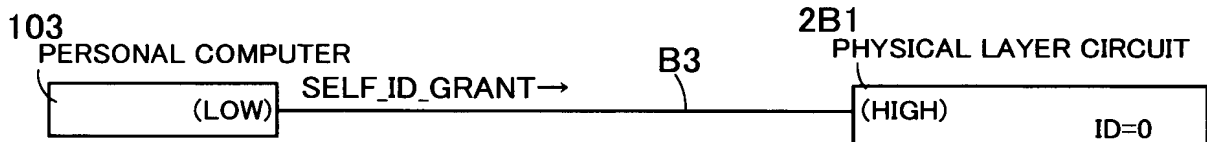
(P21) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER



(P22) OUTPUT SELF_ID PACKET OF ID = 0 TO PERSONAL COMPUTER



(P23) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER

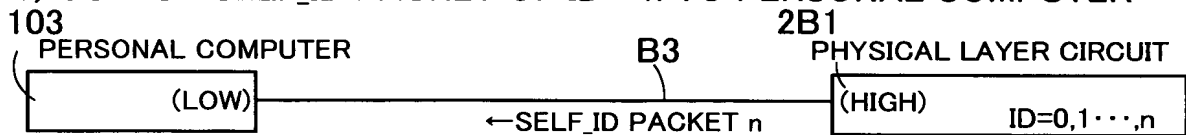


(P24) OUTPUT SELF_ID PACKET OF ID = 1 TO PERSONAL COMPUTER

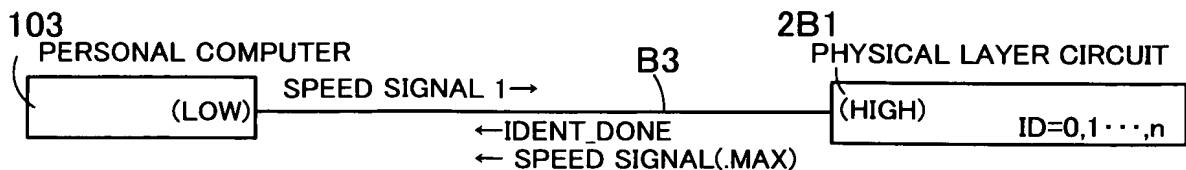


⋮

(P25) OUTPUT SELF_ID PACKET OF ID = n TO PERSONAL COMPUTER



(P26) OUTPUT IDENT_DONE AND SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO PERSONAL COMPUTER AND RECEIVE SPEED SIGNAL 1 FROM PERSONAL COMPUTER



(P27) RECEIVE SELF_ID PACKET OF ID = (N+1) FROM PERSONAL COMPUTER AND FINISH SELF-IDENTIFYING OPERATION

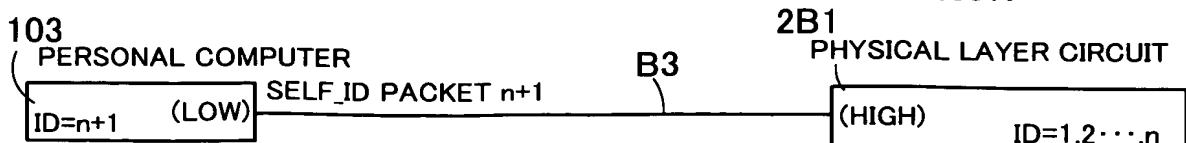


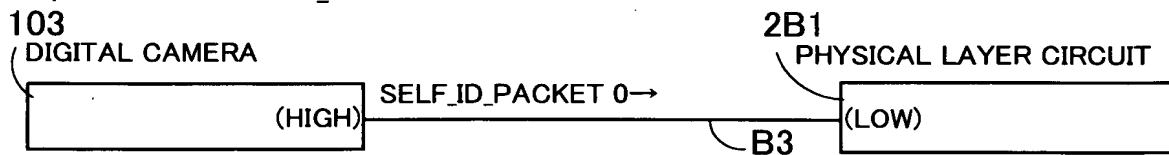
FIG. 18

SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE
OF SECOND EMBODIMENT (IN THE CASE WHERE ARBITRATION OF
DEVICE CONNECTED ON THE OTHER SIDE IS LOW)

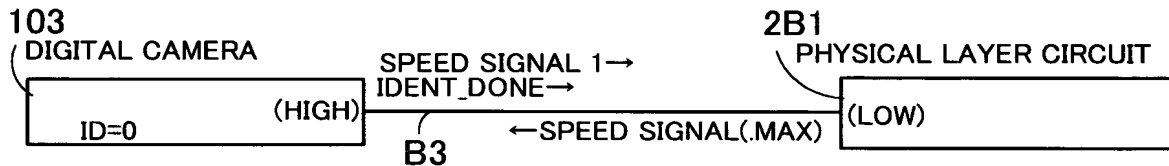
(P28) OUTPUT SELF_ID_GRANT TO DIGITAL CAMERA



(P29) RECEIVE SELF_ID PACKET OF ID = 0 FROM DIGITAL CAMERA



(P30) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA
AND OUTPUT MAXIMUM SPEED SIGNAL TO DIGITAL CAMERA



(P31) OUTPUT SELF_ID PACKET OF ID = 1 TO DIGITAL CAMERA

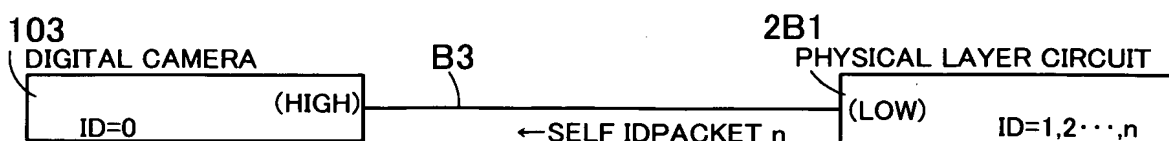


(P32) OUTPUT SELF_ID PACKET OF ID = 2 TO DIGITAL CAMERA



⋮

(P33) OUTPUT SELF_ID PACKET OF ID = n TO DIGITAL CAMERA



(P34) STOP OUTPUTTING SELF ID PACKET AND FINISH
SELF-IDENTIFYING OPERATION



FIG. 19

SECOND CONSTRUCTION EXAMPLE OF IEEE 1394 BUS TO WHICH BUS ANALYZER OF SECOND EMBODIMENT IS CONNECTED

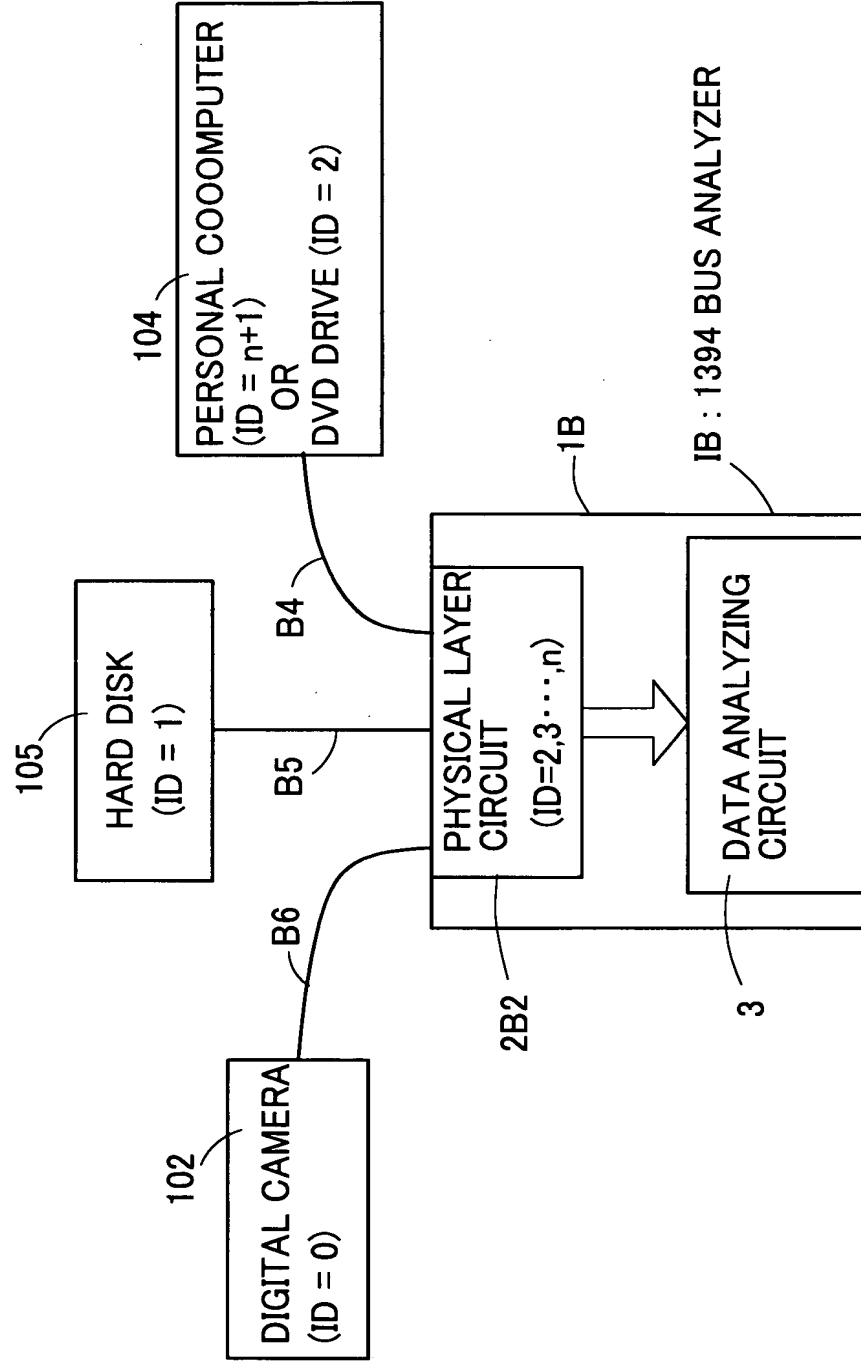


FIG. 20

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING OPERATION IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT

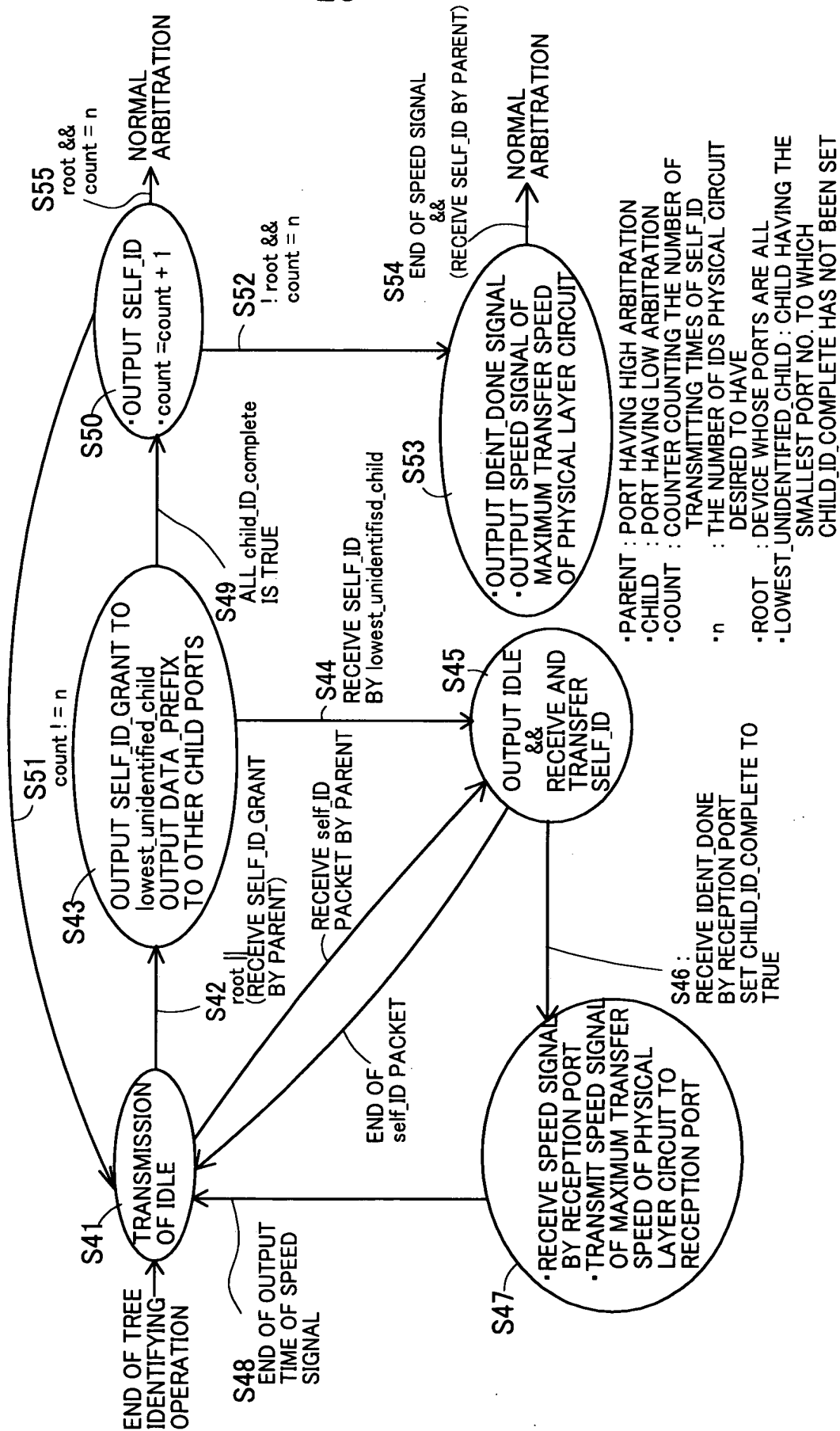
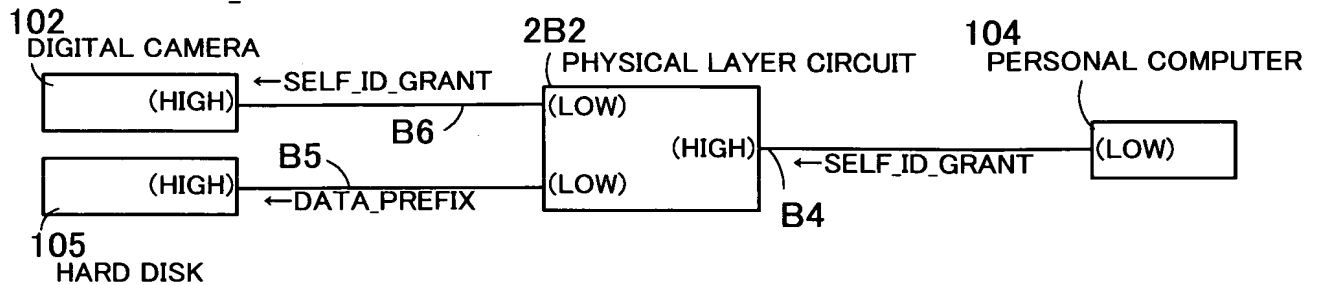


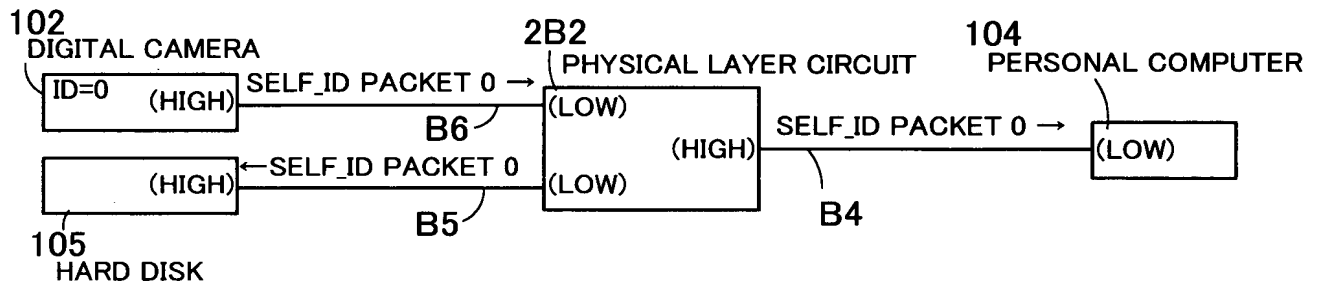
FIG. 21

SELF-IDENTIFYING OPERATION (1) IN SECOND CONSTRUCTION
EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE
CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

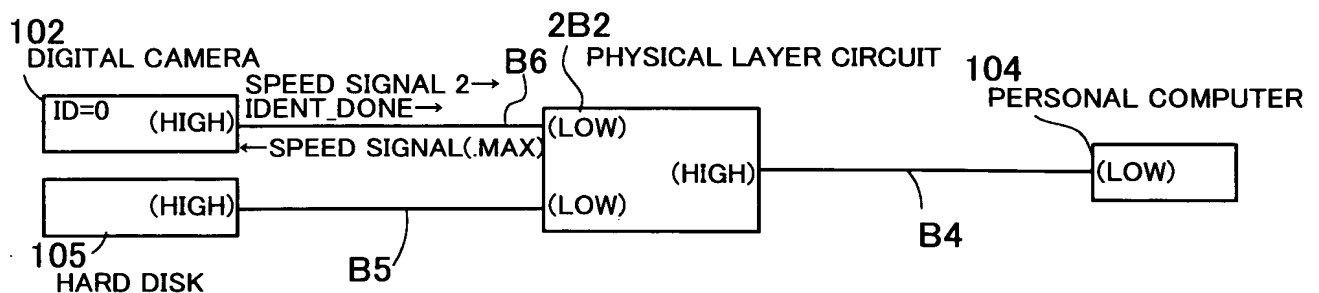
(P41) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER, OUTPUT
SELF_ID_GRANT TO DIGITAL CAMERA AND OUTPUT
DATA_PREFIX TO HARD DISK



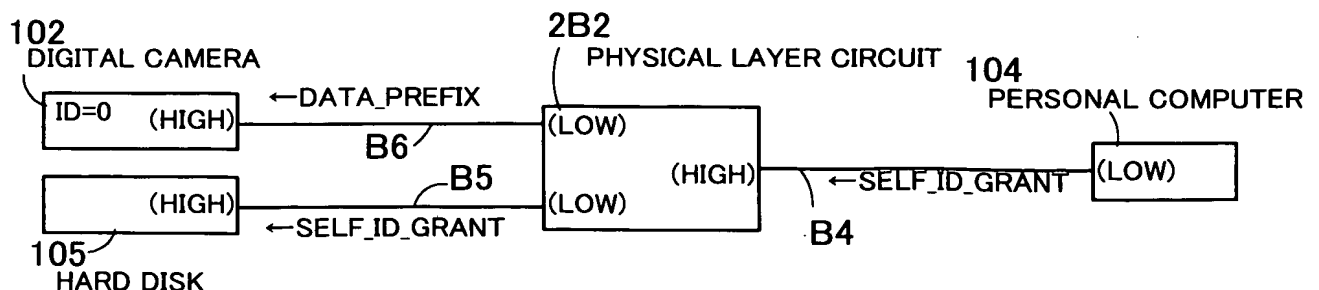
(P42) RECEIVE SELF_ID PACKET OF ID = 0 FROM DIGITAL CAMERA
AND OUTPUT IT TO PERSONAL COMPUTER AND HARD DISK



(P43) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA
AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED
OF PHYSICAL LAYER CIRCUIT TO DIGITAL CAMERA



(P44) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER, OUTPUT
SELF_ID_GRANT TO HARD DISK AND OUTPUT DATA_PREFIX
TO DIGITAL CAMERA



SELF-IDENTIFYING OPERATION (2) IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

Diagram of a network system 100. The system includes a Digital Camera 102, a Hard Disk 105, a Physical Layer Circuit 2B2, and a Personal Computer 104. The Physical Layer Circuit 2B2 is connected to the Digital Camera 102 and the Hard Disk 105 via ports B5 and B6. It is also connected to the Personal Computer 104 via ports B4 and B3. The diagram shows the transmission of SELF_ID PACKET 1 from the Digital Camera 102 and the Hard Disk 105 to the Physical Layer Circuit 2B2, and then to the Personal Computer 104. The Physical Layer Circuit 2B2 has two input ports (B5, B6) and two output ports (B4, B3). The Digital Camera 102 has an ID=0 (HIGH) port. The Hard Disk 105 has an ID=1 (HIGH) port. The Personal Computer 104 has a (LOW) port.

[illegible]

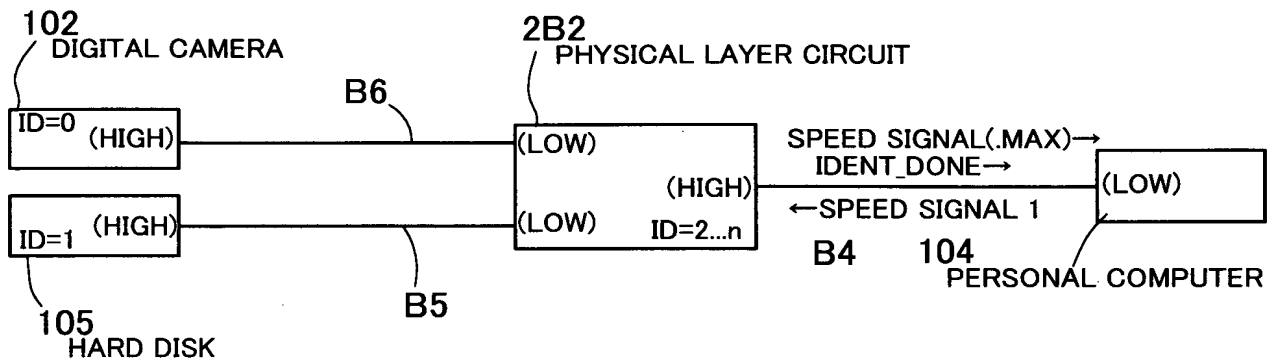
The diagram illustrates a network topology where a central **PHYSICAL LAYER CIRCUIT (2B2)** acts as a hub. It is connected to three peripheral devices: a **DIGITAL CAMERA (102)**, a **HARD DISK (105)**, and a **PERSONAL COMPUTER (104)**. The circuit manages the distribution of **SELF_ID PACKET 2** and **SELF_ID GRANT** messages. The Digital Camera and Hard Disk are shown with **ID=0 (HIGH)** and **ID=1 (HIGH)** respectively, while the Personal Computer has **ID=2 (HIGH)**. The circuit's internal state is divided into **(LOW)** and **(HIGH)** sections. Data paths are labeled **B4**, **B5**, and **B6**, indicating the flow of information between the devices and the central circuit.

Diagram of a network system 100 showing a Digital Camera 102, Physical Layer Circuit 2B2, Hard Disk 105, and Personal Computer 104. The circuit includes a B6 bus connecting the camera to the physical layer circuit, and a B4 bus connecting the physical layer circuit to the personal computer. The physical layer circuit also includes a B5 bus connecting the hard disk to the camera. The physical layer circuit is labeled with ID=0 (HIGH), ID=1 (HIGH), ID=2...n, and ID=0 (LOW). The personal computer is labeled with ID=0 (LOW). The physical layer circuit is also labeled with SELF_ID PACKET n and SELF_ID GRANT.

FIG. 23

SELF-IDENTIFYING OPERATION (3) IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

(P49) OUTPUT IDENT_DONE AND SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO PERSONAL COMPUTER AFTER TRANSMITTING PACKET AND RECEIVE SPEED SIGNAL FROM PERSONAL COMPUTER



(P50) RECEIVE SELF_ID PACKET OF ID = (n+1) FROM PERSONAL COMPUTER, FINISH SELF-IDENTIFYING OPERATION AND TRANSFER PACKET TO DIGITAL CAMERA AND HARD DISK

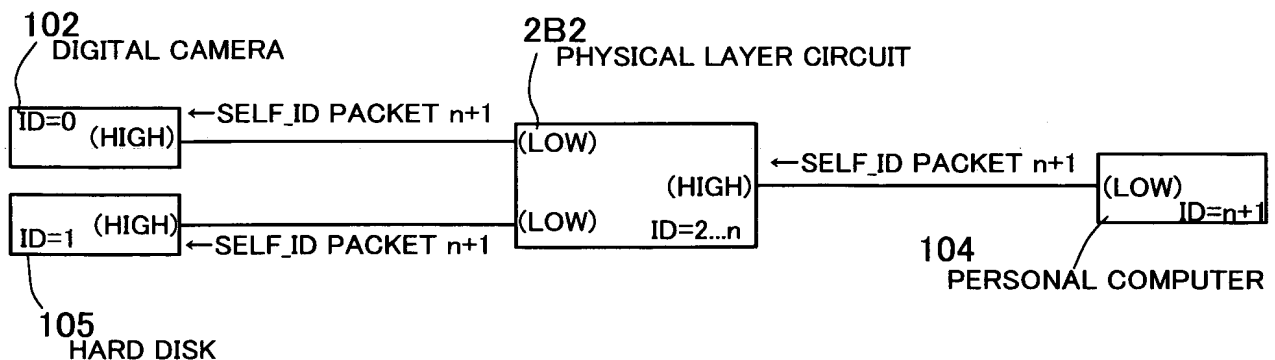
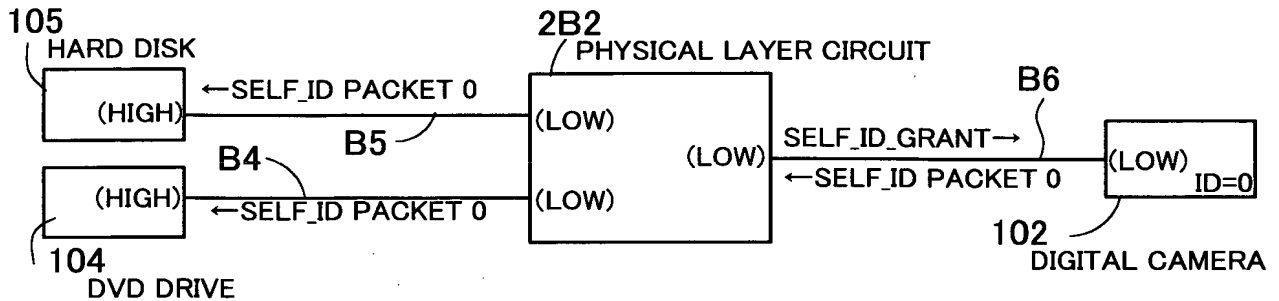


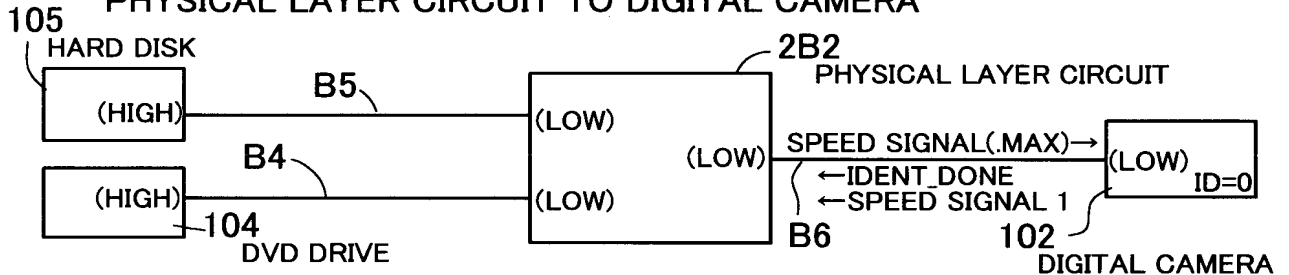
FIG. 24

SELF-IDENTIFYING OPERATION (1) IN SECOND CONSTRUCTION
EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE
CONNECTED ON THE OTHER SIDE DOES NOT HAVE DEVICE HAVING
HIGH ARBITRATION)

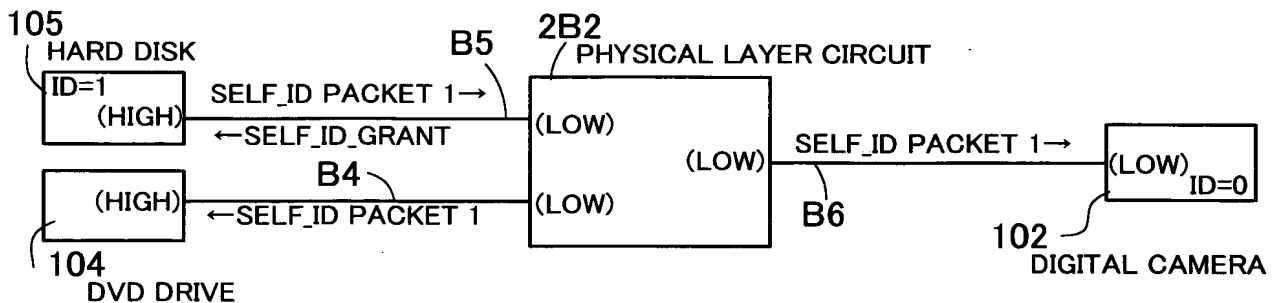
(P51) OUTPUT SELF_ID_GRANT TO DIGITAL CAMERA, RECEIVE SELF_ID
PACKET FROM DIGITAL CAMERA, AND TRANSFER IT TO HARD DISK
AND DVD DRIVE



(P52) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA
AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF
PHYSICAL LAYER CIRCUIT TO DIGITAL CAMERA



(P53) OUTPUT SELF_ID GRANT TO HARD DISK, RECEIVE SELF_ID PACKET
OF ID = 1 FROM HARD DISK, AND TRANSFER IT TO DIGITAL CAMERA
AND DVD DRIVE



(P54) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM HARD DISK AND
OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF
PHYSICAL LAYER CIRCUIT TO HARD DISK

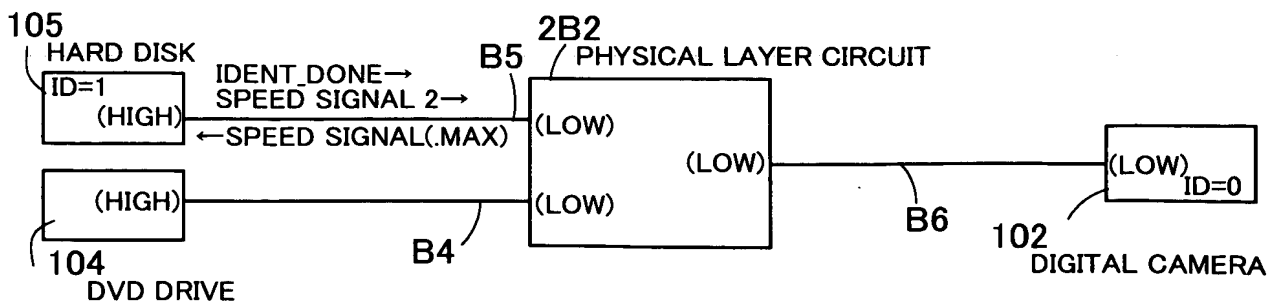
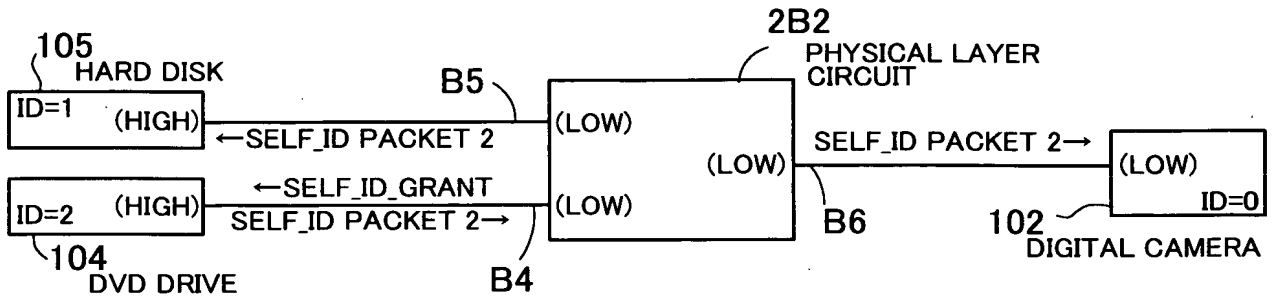


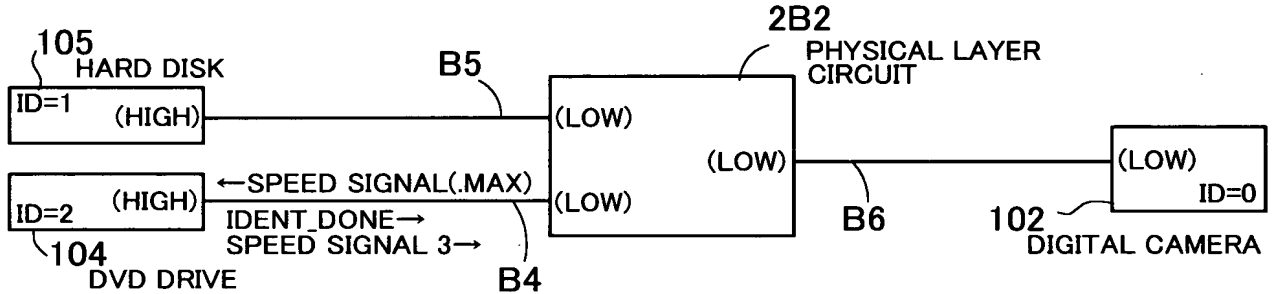
FIG. 25

SELF-IDENTIFYING OPERATION (2) IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE DOES NOT HAVE DEVICE HAVING HIGH ARBITRATION)

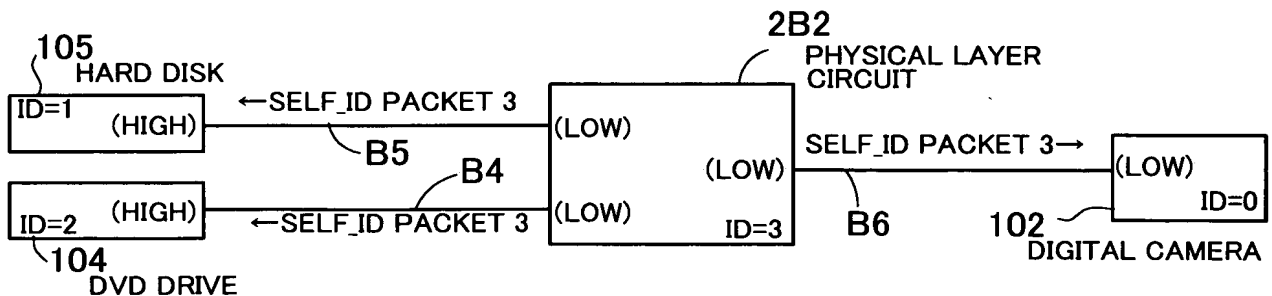
(P55) OUTPUT SELF_ID GRANT TO DVD, RECEIVE SELF ID PACKET FROM DVD DRIVE, AND TRANSFER IT TO DIGITAL CAMERA AND HARD DISK



(P56) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DVD DRIVE AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO DVD DRIVE



(P57) OUTPUT SELF_ID PACKET OF ID = 3



(P58) OUTPUT SELF_ID PACKET OF ID = n AND FINISH SELF-IDENTIFYING OPERATION

